

**REMARKS**

Claims 8-32 are pending in the present application. Claims 20-32 are withdrawn from consideration. Claims 8-19 are rejected. Claim 18 is herein amended. No new matter has been entered.

**Election/ Restrictions**

A provisional election was made with traverse to prosecute the invention of Group I, claims 8-19. Applicants herein affirm this election.

**Claim Rejections - 35 U.S.C. §112, second paragraph**

Claim 18 is rejected under 35 U.S.C. §112, second paragraph, as being indefinite by the phrase “comprising one or more elements selected from a group of base metals are mixed in any proportions”, because it is not clear what elements the group is consisted of.

Applicants herein clarify the claim.

With respect to the asserted indefiniteness of the term “base metal”, Applicants submit that the term “base metal” is commonly used to refer to a metal that oxidizes or corrodes relatively easily, and reacts variably with diluted hydrochloric acid (HCl) to form hydrogen, generally including the metals iron, nickel, lead and zinc. One skilled in the art would immediately understand what the term “base metal” refers to.

**Claim Rejections - 35 U.S.C. §103(a)**

Claims 8-17 are rejected under 35 U.S.C. §103(a) as being unpatentable over Wirtz et al. (Template Synthesized Gold Nanotube Membranes for Chemical Separation and Sensing, Analyst, 2002, 127, 871-879, First Published as an Advanced Article on the Web 14<sup>th</sup> May 2002).

With respect to claims 16 and 17, the Examiner asserts that Wirtz et al. disclose a skeleton of gold nanotube having an effective inside diameter of molecular dimensions (abstract).

The Examiner asserts that Wirtz et al. do not specify the dimensions of the gold nanotube as claimed. However, the Examiner asserts the general rule that merely changing the size of an article is generally not a matter of invention.

Applicants take issue with the above assertion that a change in size does not patentably distinguish over a prior art that teaches a similar object. Applicants note that the exact terminology is that “where the only difference between the prior art and the claims was a recitation of relative dimensions of the claimed device and a device having the claimed relative dimensions would not perform differently than the prior art device, the claimed device was not patentably distinct from the prior art device.”

Applicants note that the cited reference (Wirtz et al. “Template synthesized gold nanotube membranes for chemical separations and sensing”), and submit that, as shown in FIG. 9 and the description thereof (right column on page 877), a nanotube of 1.5 nm through 4 nm in diameter is obtained. Applicants note, however, that this diameter is an *inner* diameter, and the *outer* diameter is not described. By the method described in the cited reference, a nanotube of

“about 5 nm through 7 nm” in outer diameter as similar with the present invention cannot be obtained.

The outer diameter of the nanotube in the cited reference is assumed to be from several tens of nm through several hundreds of nm. Even if inner diameters of nanotubes match with each other, functions as a nanotube are obviously different when outer diameters and thicknesses are different.

With respect to claims 8-15, the Examiner characterizes the limitations therein as mere recitations of intended uses of the noble metal nanotubes and therefore, they are not given any patentable weight, as indicated in the Manual of Patent Examining Procedure (MPEP) §2111.02 (II).

Applicants disagree with the assertion that MPEP §2111.02 (II) is appropriate in this rejection, because MPEP §2111.02 (II) refers only to intended uses as recited in a preamble of a claim. In the present case, the claims do not include such an intended use in the preamble.

Claims 18 and 19 are rejected under 35 U.S.C. §103(a) as being unpatentable over Wirtz et al. as applied to claim 16 above in view of Green et al. (US 6,090,363).

Applicants disagree with this rejection and specifically disagree with the Examiner's rationale for combining the cited patent and publication. Moreover, even if the cited references were combined, the present invention would not have been reached.

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Second, there must be some suggestion or motivation, either in the references themselves or in

the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Finally, there must be a reasonable expectation of success. (Manual of Patent Examining Procedure (MPEP) §2142). The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on Applicant's disclosure.

The Examiner concludes that it would have been obvious to substitute part of gold with nickel in the nanotube of Wirtz et al. with an expected success, because gold and nickel are functionally equivalent in terms of being used as heterogeneous catalysts as disclosed by Greene et al.

Green et al. teaches that a carbon nanotube can be *filled* alternatively with Au or Ni, both of which are useful as catalysts. However, Green et al. does not address the substitution of a base metal such as Ni *into the skeleton* of its carbon nanotube; rather, Green et al. teaches the filling of its nanotube with gold or nickel.

One skilled in the art could charitably be said to be motivated to *fill* a nanotube with a base metal such as Ni for the purpose of creating a catalyst as taught by Greene et al. However, such action would not reach the present invention, which requires a gold skeleton of a nanotube to be partially *substituted* with a base metal, not filled with a base metal. Therefore, Applicants disagree with the rejection of claims 18 and 19 for lack of motivation to substitute the base metal into the noble metal skeleton.

Application No. 10/520,017  
Attorney Docket No. 043165

Amendment under 37 C.F.R. §1.111  
Amendment filed October 25, 2007

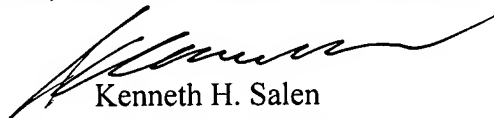
In view of the aforementioned amendments and accompanying remarks, Applicants submit that the claims, as herein amended, are in condition for allowance. Applicants request such action at an early date.

If the Examiner believes that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney to arrange for an interview to expedite the disposition of this case.

If this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. The fees for such an extension or any other fees that may be due with respect to this paper may be charged to Deposit Account No. 50-2866.

Respectfully submitted,

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